

Mathematics

Practice Questions for grade 11

1. Write $P(P(X))$ where X is the null set and $P(X)$ represents power set of X .
2. Find the smallest positive integer n for which $\left(\frac{1+i}{1-i}\right)^n = 1$
3. If $\alpha - i\beta$ is the root of the quadratic equation $f(x) = 0$, write the second root
4. The 5th term of a certain G.P series is 81, whereas the 2nd term is 24. Find the common ratio
5. The value of $\cos n\pi, n \in N$ is ?
6. Prove that $2 \cos \theta = \sqrt{2 + \sqrt{2 + 2 \cos 4\theta}}$
7. If three angles A, B and C are in A.P., show that $\cot B = \frac{\sin A - \sin C}{\cos C - \cos A}$
8. If $x + iy = \sqrt{\frac{a+ib}{c+id}}$, show that $(x^2 + y^2)^2 = \frac{a^2 + b^2}{c^2 + d^2}$
9. Find the focus and the equation of directrix of the parabola $y = x^2 + x + 1$
10. Find the value of t for which the straight line $(2x+3y+4)+t(6x-y+12) = 0$ is parallel to y -axis.
11. Find the image of the point $(3,4)$ on the line $x+y = 0$
12. If $iz^3 + z^2 - z + i = 0$, then show that $|z| = 1$
13. Using principle of Mathematical Induction prove that $\frac{1}{\sqrt{1}} + \frac{1}{\sqrt{2}} + \frac{1}{\sqrt{3}} + \dots + \frac{1}{\sqrt{n}} > \sqrt{n}$ for all $n \in N$
14. Prove that $\cot 7\frac{1}{2}^\circ = \sqrt{2 + \sqrt{3 + \sqrt{4 + \sqrt{6}}}}$
15. Solve for θ : $\tan^2 \theta + \cot^2 \theta = 2$
16. If S_1, S_2 and S_3 be respectively the sum of $n, 2n$ and $3n$ terms of a G.P. Prove that $S_1(S_3 - S_2) = (S_2 - S_1)^2$
17. If α and β are the roots of the equation $2x^2 - 3x - 6 = 0$, find the equation whose roots are $\alpha^2 + 2, \beta^2 + 2$
18. A circle of constant radius $3K$ passes through the origin and meets the axes in points A and B . Prove that the locus of the centroid of the triangle OAB is the circle $x^2 + y^2 = 4K^2$

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